

General solution to the stochastic control on the half line with some optimal consumption and dividend applications

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ABSTRACT

We consider a semilinear parabolic equation with its domain concentrated on the half line $(0, +\infty)$. The equation corresponds directly to stochastic control and stochastic game problems with a compact control space and an uncertain time horizon given by a stopping time. This is a typical problem for many financial and actuarial applications. We provide a set of general assumptions to ensure that there exists a smooth classical solution to that equation. In the proof we use the fixed point theorem to the simplified equation and extend it by making some transformations and approximations. Such result can be seen as a very comfortable starting point to consider other control problems, for example those with unrestricted control space. Some examples concerning consumption and dividend problems will be provided.

The talk will be based on

D. Zawisza, *Stochastic control on the half-line and applications to the optimal dividend/consumption problem*, arXiv:1703.07339